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AMC Pamphlet
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SAFETY DIGEST

July 1964

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UNITED STATES ARMY MATERIEL COMMAND
WASHINGTON, D.C. 20315

THE WHITE HOUSE

WASHINGTON

March 23, 1964

Dear Mr. Secretary:

The death of 43,400 Americans in traffic accidents last year is a matter of serious national concern. There is an obvious and urgent need for a program to improve our highway safety rapidly and significantly. As a nation, we cannot continue to tolerate this drain on our resources, and as human beings, we cannot continue to tolerate this terrible pain, suffering and loss of life.

The Federal Government should, therefore, take all appropriate steps to reduce this carnage. Because of the responsibilities of your Department's Bureau of Public Roads in this area, I am designating you to undertake immediately an accelerated attack on traffic accidents in this country. State and local governments should be encouraged and assisted in developing priority safety programs giving special attention to hazards on highways with high-accident experience.

I understand that such a safety priority program can be undertaken within the present Federal-aid program and the resources of the Highway Trust Fund without cost to the general taxpayer.

In a society such as ours where human life and health is valued so highly, there is a special obligation to use our scientific abilities to bring this problem of highway traffic safety under control.

Please keep me advised of the steps taken and of the results of your intensive traffic safety campaign.

Sincerely,

Honorable Luther H. Hodges
Secretary of Commerce
Washington, D. C.

FOREWARD

The Safety Digest is an AMC Pamphlet prepared by the Safety Division, U. S. Army Materiel Command. Its purpose is to disseminate information which can materially influence and improve safety programs at all Command establisnments.

Articles are included to supplement technical knowledge as well as practical knowledge gained through experience. They provide a basis for the further refinement of safety measures already incorporated in operating procedures and process layout. To achieve maximum effectiveness, the Safety Digest should be given widespread circulation at each AMC establishment.

Articles appearing in the Safety Digest are unclassified and are not copyrighted. They may be reproduced as desired in order to bring pertinent accident prevention information to the attention of all employees. The Army Materiel Command Safety Digest should be given a credit line. when articles are extracted.

Unclassified material believed to be of interest or benefit to other establishments is welcomed for publication in the Safety Digest. Please send articles for review to: U. S. Army Materiel Command Field Safety Agency, Charlestown, Indiana. If possible, include pictures, charts, drawings, and illustrations that clarify and heighten interest in your presentation.

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Front cover shows a LARC unloading from a BARC.

Rear cover shows a CV-2 (Caribou)

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The photograph on front cover of the May 1964 Safety Digest was taken at Fort Bragg - not at Fort Benning.

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SAFTY LEADERS CONFER

Motivation was the central theme of the U. S. Army Munitions Command Conference of Safety Directors held recently at the Ammunition Procurement and Supply Agency, Joliet, Illinois. Shown with a poster used at the conference are Fred M. Bishoff, Chief, Safety Division, Army Materiel Command; Harry Berlin, Traffic Safety Director, U. S. Air Force; E. W. Van Patten, Safety Director, U. S. Army Munitions Command; and Walter P. Stanckiewitz, Safety Director, Ammunition Procurement and Supply Agency.

WAS WEATHER A CAUSE FACTOR ?

Charles M. Terry, Lt. Colonel, USAF
Staff Weather Officer, USAAVNC

For every Army aircraft accident or incident someone must make a statement as to whether or not weather is involved, and if so, in what way (e.g., gusty winds, density altitude, etc.). Anyone who has been required to prepare a Crash Facts Message in accordance with AR 385-40 should recognize this as item #8 in the list of mandatory reporting items. During calendar year 1963, 84 Crash Facts Messages indicated that weather was a known or suspected cause factor. Forty-five of these were major accidents.

A review of the final accident reports for the 45 major accidents revealed that accident investigation boards considered weather to be a factor in only 22 of the accidents. In other words the crash facts data was only about 50% reliable. It is apparent that there is a considerable variance in opinion as to what constitutes a weather cause factor. Why is it that weather is so often incorrectly reported to be a cause factor?

There are two primary reasons for this: (1) There is a general lack of understanding as to what constitutes a weather cause factor, and (2) Weather is often listed as a possible cause factor in an effort to provide an excuse for pilot error accidents.

When should weather conditions be considered as cause factors? Obviously a weather element or condition is not always a cause factor simply because it exists. The most common error in this regard is the reporting of surface winds as a cause factor. Safe operating limits of cross-wind and gust spread have been determined for the various types of Army aircraft. If the existing surface wind conditions are within these specified limits and are known to exist, wind could not be considered a cause factor since aviators are expected to be able to make necessary compensations.

A weather element or condition can be assessed as a primary cause factor only when it is unexpected or unknown and when it affects the control or performance of an aircraft so that an accident is inevitable. A weather element or condition which is forecast or reported and known to exist can be a contributing cause factor when avoiding it is beyond the aviator's capabilities; e.g., an aviator on a cross-country flight is aware that a portion of the route is forecast to have zero visibility in fog. Upon passing over this area an emergency occurs and he is forced to land. However, weather would not be a cause factor if an aviator is aware of a dangerous weather condition and has an alternate course of action but elects to continue the flight into the hazardous weather.

When accidents are due to carelessness or failure to follow established procedure, it is human nature to look for an excuse. One of the favorite excuses is weather. In such instances saying that a weather element or condition is a contributing cause is comparable to saying that an accident is due to the ground being too high or the runway too short. This can be carried to the point of absurdity. As an example, a recent accident report listed weather as a cause factor in an accident in which the aircraft crashed into the trees at the end of the runway. A calm wind was considered a factor because the no-wind condition made it difficult to land in the short distance available!

Was weather a cause factor? A conscientious application of the guide lines set forth in this discussion should result in a correct answer in most every instance. Then item #8 in the Crash Facts Message can be used for its intended purpose, (i.e. an indication of the involvement of weather in Army aviation accidents and incidents).

"WEEKLY SUMMARY" USABAAR

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(Editors note: Accurate and meaningful processing of accident data reported on DA Forms 285 depends on the ability of the person filling out the form. There has been noticeable improvement of coding recently. However, too many reports are still received which are of doubtful accuracy. A recent study of approximately 20,000 D. A. punch cards revealed that about 10% contained some inaccuracies. Safety personnel are urged to make sure that DA Forms 285 are properly completed. Check and recheck to be certain that coding complies with AR 385-41 with changes 1 and 2.)

MATERIALS HANDLING SAFETY TRAINING

W. A. Pratt, Chief, Safety Engineer
Thiokol Chemical Corporation, Longhorn Army Ammunition Plant

Technological advances in the aerospace industry have required the development of highly specialized handling equipment. Increased application of mechanical equipment, to provide more efficient materials handling, must be accomplished if handling costs are to be reduced and operations performed more efficiently. But, unless we are wary of the safety hazards involved, this advance in efficiency and economy may be offset by personnel injuries and property damages.

It has been estimated that 25 per cent of all industrial accidents occur in the handling of materials. While the greatest number of these accidents occur in manual handling, the more serious and destructive accidents often occur when mechanical handling equipment is used.

The impact of accidents involving mechanical handling equipment can be more fully realized when the total effect on the rocket industry is considered. Losses incurred by mechanized handling accidents ranged from minor injuries to loss of life, prolonged work stoppages, extensive product loss, and destruction of facilities.

It is estimated that 90 per cent of all industrial activity involves some type of mechanical handling equipment. The percentage is increased even more as the size and weight of production items are increased. In many instances mechanical handling must be provided throughout the entire manufacturing process. With this in mind, it is apparent that equipment must be designed and installed to handle the job, and it must meet safety standards.

The primary consideration in providing mechanized handling is engineering. Criteria for design and fabrication is the first step. After fabrication the equipment is installed and tested, and a preventive maintenance program (which will provide comprehensive inspection and maintenance of equipment) is established.

Fulfillment of requirements for design, installation and preventive maintenance is not the complete solution. If accidents are to be prevented in the use of mechanical handling equipment, effective training and education of operating and supervisory personnel must be accomplished.

Experience indicates that a majority of mechanized handling equipment accidents have been caused by unsafe acts of the operators. Operators had not received adequate training and were unaware of hazards associated with the equipment. Training is therefore necessary for the safe operation.

With the need for training established, local implementation of such a program must follow. The training course must be designed, prepared, and presented in a manner which will both train and test personnel in the safe and proper use of the equipment. Information must be gathered from manuals, safe practice pamphlets, manufacturers' instructions, and the codes, rules, and regulations of accepted authorities. The training course should be planned for the equipment that will be used at the installation. It should provide for the use of available instructors, equipment and training space.

One such installation program was developed to train personnel in the use of hoists, slings, chains and monorail systems. The program is scheduled and accomplished in the following manner:

I. Selection of Candidates by Supervisor.

   A. Need for training established on basis of job requirements.
   B. Candidates' qualifications certified.

II. Training Schedule Developed.

   A. Pretraining material supplied to candidate.
   B. Attendance at session scheduled.

III. Training Program.

   A. Introduction.
      1. Pretest aptitude and experience.
      2. General discussion.

B. Hoisting apparatus.
   1. General recommendations - Safety factors.
   2. Types and capacities.
      a. Chain hoists.
      b. Electric hoists.
      c. Air hoists.
   3. Operation.
   4. Safety devices.
   5. Causes of failure - Inspection.

C. Slings.
   1. General recommendations.
   2. Types and capacities.
   3. Use and application.
   4. Causes of failure - Inspection.

D. Conveyor systems.
   1. Types and construction.
      a. Belt and chain conveyors.
      b. Monorails.
      c. Trolleys and monotractors.
   2. Use and operation.
   3. Safety devices.
   4. Causes of failure - Inspection.

E. Review and test.
   1. Final examination - Written quiz.
   2. Operating performance test - Hoists, slings, and conveyors.
   3. License operators.

To supplement training, on-the-job instruction and performance review are administered by the supervisor.

The Materials Handling Safety Training Program at the solid propellant rocket motor manufacturing facility has been a continuous effort since its beginning in 1958; the results have far exceeded original expectations.

In the classroom at Longhorn Army Ammunition Plant an instructor makes use of a demonstration item to teach the correct and safe use of hoists. Other subjects taken up in detail in the installation materials handling safety training course are slings and conveyor systems.

Items transported by the mechanical handling equipment at the Longhorn Army Ammunition Plant require careful handling by trained operators. An employee who has completed the installation's materials handling training course is shown operating the monorail monotractor that moves a motor out of a curing oven.

RESPIRATOR MAINTENANCE

Fred L. Foltz
U. S. Army Supply and Maintenance Command Safety Field Office

The life of the user can depend on the proper functioning of a respiratory protective device. For this reason, it is vital that the device be properly maintained.

If practicable, a centralized maintenance station should be set up for respiratory devices, staffed by trained personnel thoroughly familiar with their construction, requirements and cleaning procedures. To make sure that respiratory protective devices will always be ready for immediate use when needed, they should be inspected regularly. Particular care should be taken not to overlook units that may be stored in various areas for emergency use.

To protect the user, respiratory devices must be airtight. Inspections must include careful checking of all rubber parts for signs of hardening and deterioration. By stretching and massaging the rubber between the fingers, the inspector should be able to find defects and also help prolong the life of the rubber.

The inspector must also check all gaskets for tightness or needed replacement, inspect metal parts for corrosion, and look for cracks or breakage of glass or plastic parts. Worn, deteriorated or broken parts should be replaced immediately. Only replacement parts made specifically for the device should be used. Unless installation personnel have the technical knowledge, ability and equipment to repair intricate parts, it is usually wiser to replace the part as a unit or send it to the manufacturer for repair.

Since respiratory devices are worn on the face, they should be cleaned and sanitized after each use. Although the following general comments are applicable, the manufacturer's specific instructions should be followed because the devices contain many different materials.

Hot water, steam, solvents and ultraviolet light should not be used in cleaning and disinfecting, because face pieces contain rubber or rubberlike compounds. A mild caustic cleaner rather than a solvent should be used to remove paint or other difficult materials.

Rubber masks can ordinarily be cleaned by warm water and detergent used with a hand brush or a washing machine. Most detergents should be rinsed from the device before it is disinfected.

Suitable disinfectants may include solutions containing formaldehyde, modified phenolics, hypochlorite or quarternary ammonium compounds. With most disinfectants, the device should be rinsed in clean water and dried after disinfecting. A possible exception is the quarternary ammonium compounds. With them it may be better to omit the final rinse, since the residue will continue to act as a disinfectant without irritating the skin. Several combination cleaning and disinfecting materials are available in liquid or powder form. These contain a detergent and quarternary ammonium salts so that the washing and sanitizing operations can be performed in one step.

After cleaning, disinfecting and reassembly, the respiratory device should be stored in a dust-proof container. Most such devices are originally packaged in re-usable cartons or cases, and these can be used during storage. The storage area should be clean, dry and of moderate temperature. Exposure to heat, extreme cold, sunlight and excessive moisture over extended periods must be avoided.

Special attention should be given to the storage of units for emergency use at sites where they may be needed. It is often necessary to construct special compartments to provide protection from the weather and from process materials and equipment. In many cases duplicate sets of emergency respiratory devices should also be stored for ready availability just outside the hazard area.

Respiratory protective devices should not be stored in tool boxes or lockers unless they are packaged in a carton or other separate container.

Proper maintenance of compressed-oxygen recirculating apparatus requires the replacement of the carbon dioxide removing chemical after use and the refilling of the oxygen cylinder. Pressure must be checked periodically and the cylinder repressurized as needed. The tightness of the high-pressure and low-pressure sides must be checked periodically following the manufacturer's instructions. These should be followed also in making periodic tightness checks of self-generating apparatus.

After each use of a hose mask, the hose should be checked for signs of wear and steam cleaned when necessary. The blower should be checked periodically for proper functioning. The hose should be capped when not in use to prevent dust and other contaminants from getting inside.

After each use of an air-line respirator the facepiece should be serviced, the flow-control valves inspected, cleaned, and repaired if necessary, and the air-line hose checked for wear and damage and cleaned as needed. The chemical cartridge in the continuous-flow control valve assembly must be changed as the need arises. To assure that the users will receive respirable air, periodic inspections should be made of the air supply system, including air compressors, air-cylinder manifold systems, pressure reducers, pressure-release valves, air-line filters, air-line instrumentation, permanent piping and outlet fittings.

Gas masks should be inspected to make sure that the lenses are intact and firmly in place; rubber materials are flexible and uncracked; head harness is flexible, with straps and buckles in good condition; exhalation valve is intact, works easily and is clean; breathing tube is flexible, without cuts, and securely fastened to the canister neck of the timer outlet; canister is the right type, without dents and rust spots, and securely attached to the canister harness. If a timer is used, its gaskets should be checked for replacement and contact, and the timer reset when a new canister is attached. "Universal" canisters should be replaced as soon as exhausted or, if not wholly used, after one year from the date of seal is broken. Canisters should be stored in a clean, dry, cool place and the stock issue regulated so that no canister is stored over four years before it is used.

Since self-resuscitators must always be ready for use, frequent inspections are vital. Self-resuscitators for protection against carbon monoxide utilize hopcalite and must be protected from moisture. The manufacturer's instructions should be followed for checking the moisture seal regularly and frequently.

When the breathing resistance of filter respirators becomes uncomfortable to the wearer, the mechanical filter should be replaced. In plants with centralized maintenance stations, the old filter may be discarded and a new one installed when the respirator is serviced. Some respirators have filters that can be cleaned for re-use.

When the wearer of a chemical-cartridge respirator detects an odor or irritating effect from the contaminant, the cartridge should be changed. In plants with a centralized maintenance station, cartridges may be discarded according to an established schedule based on group experience.

Special attention must be given to the storage of chemical cartridges, since they may deteriorate in the presence of excessive moisture or of gaseous contaminants. They should not be stored in the area where the chemical-cartridge respirator is to be worn.

SAFE HANDLING OF BERYLLIUM

New uses are constantly being found for previously little-used metals and compounds. These may present unfamiliar or unexpected hazards to the personnel who must work with them. An example of these is beryllium, and salts and alloys that contain it.

Metallic beryllium, its alloys, beryllium oxide, beryllium hydroxide, or beryllium salts, when inhaled as mists, dusts, or fumes, may cause acute or chronic disease. Introduction of metallic beryllium, beryllium oxide, or beryllium salts into open wounds may result in abnormal tissue growth. Skin irritation may result from direct contact with beryllium. Beryllium oxide fumes may be vaporized when heating the metal above 1400°F. and the oxide above 3100°F. Beryllium in the form of dust or powder, is a mild fire hazard.

Factors in process design and operation which are essential to satisfactory control of hazards associated with beryllium include the following:

a. Close attention to procedural details. Standing operating procedures are required for all operations.

b. Restriction of manual process steps. Exposure of personnel to potential hazards should be minimized.

c. Careful application of local exhaust ventilation to process steps. Mists, dusts and fumes should be controlled at the point where they are generated.

d. Frequent air sampling to discover incipient control deficiencies.

e. Thorough housekeeping.

f. Education of employees in hazards involved and controls required.

Personnel exposed to beryllium hazards should be prepared to make use of the following emergency procedures:

a. If beryllium powder or chips enter the eyes, flush with water at least 15 minutes and obtain medical attention as quickly as possible.

b. If beryllium powder or chips come into contact with open wounds, flush with water for 15 minutes and obtain medical attention promptly.

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DRIVE SMALL CARS WITH CARE

William T. Buhrman, Safety Director
Second U. S. Army

Occupants of so-called "compact" or small cars (under 2,800 lbs) are approximately 3 times as likely to be seriously injured or killed if involved in a traffic accident as are the occupants of the standard full dimension car.

Motor vehicle accident studies disclose this civilian experience ratio (provided by the National Safety Council) is also typical of military experience in the use of the small private motor vehicle.

A vehicle accident survey at one large Second U. S. Army installation disclosed the small car versus full dimension car accident experience to be as follows:

a - Small car registration = 12.4% of total vehicles
b - Small cars involved in 24.3% of total reportable accidents
c - Small car accidents resulted in 38% of total fatalities
d - Small car accidents resulted in 24% of disabling injuries
e - 78% of the small car accidents were "one car accidents"
f - 57% of the small car accidents occurred at night

The small car (in competing with larger vehicles) has a number of disadvantages that must be offset by driver skill and knowledge if reasonable safety is to be expected. These disadvantages are:

a - They are lighter in weight and construction, thus have less "absorbing power" or crushability in materials (frame and body) when colliding with fixed or moving objects.

b - Passenger space is limited.

c - Lightness and steering characteristics encourage "over-control" and make roadholding harder in wind gusts from passing tractor-trailers or natural cross-winds.

d - Lowness of the small car places it directly in the path of the intense headlight beams of larger vehicles, trucks and busses which can easily result in temporary blinding effects.

e - Lowness of lights on small cars give the drivers less light advantage from their own vehicles if lights are legally adjusted.

f - In cool or cold weather the interior windows of small cars are more likely to "fog up" due to limited passenger space, thus impairing drivers visibility.

g - Many small cars require high motor rpm for maximum power output; thus they are usually operated at higher proportionate speeds which can trap drivers unless they are unusually alert.

h - The small car in collision is often over-ridden by larger vehicles and its occupants then receive direct crushing forces.

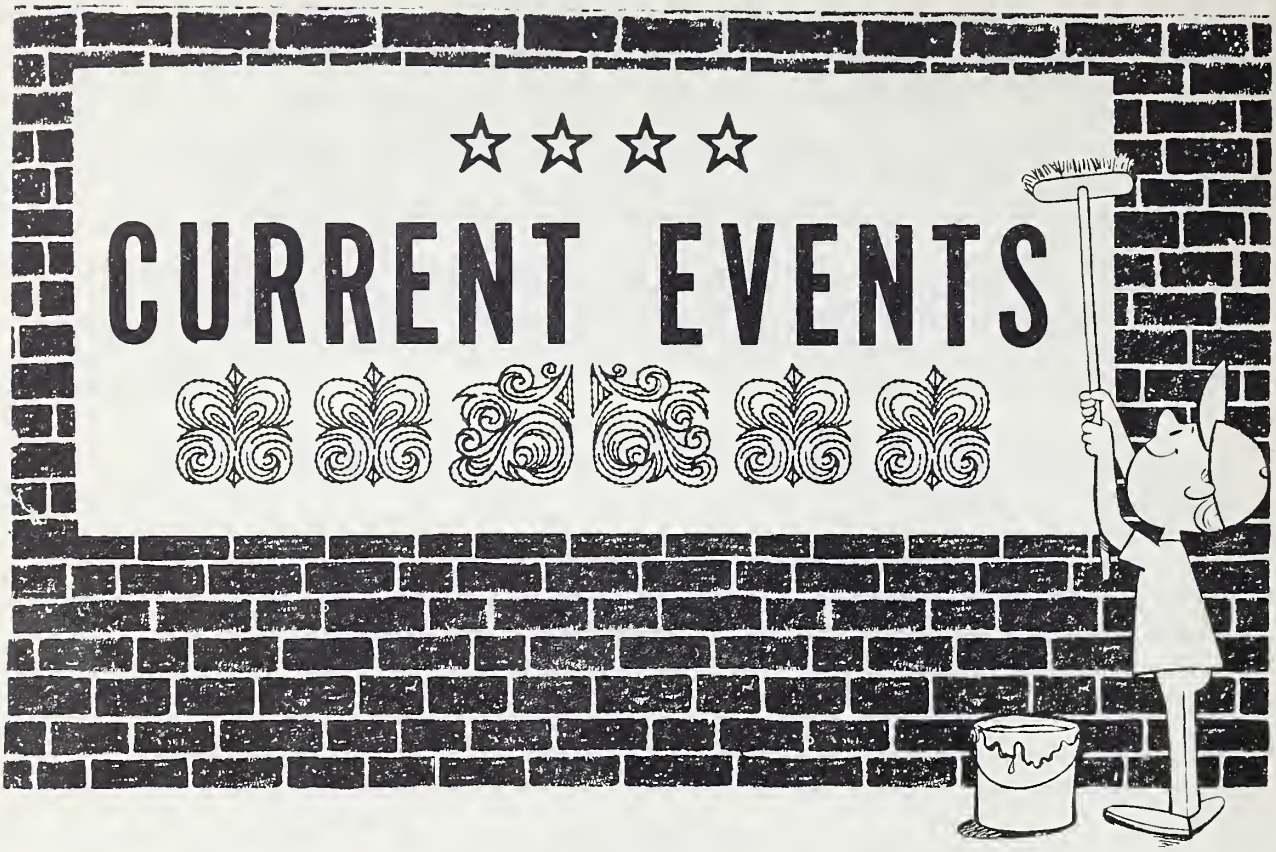
Small cars have many advantages that the public likes and appreciates: But they must be driven at all times with their limiting factors of safety in mind.

Continued from Page 12

SAFE HANDLING OF BERYLLIUM

c. If inhalation of beryllium dusts, mists or fumes occurs or is suspected of having occurred, immediate medical attention should be obtained.

d. If beryllium powder is spilled, evacuate the area immediately, move upwind and wear an approved-type respirator Use approved procedures for cleaning up the spill.



SEAT BELT AIDED DRIVER

The enlisted man was driving an Army half-ton pickup truck on a divided lane highway at dawn. Traffic was light and his rate of speed was 55 mph. Suddenly a dog stepped into the road ahead of him. Startled, he instinctively swerved to avoid striking the animal. The left wheels of the truck ran off the pavement on to the median strip.

The driver lifted his foot from the accelerator to reduce speed before pulling his left wheels back upon the pavement. By this time all wheels were off the paved surface, and the vehicle was approaching a concrete soil erosion barrier. He turned the steering wheel in an effort to return to the pavement and the vehicle went into a skid. It turned on its side and began to roll and flip. The vehicle was upright when it came to a stop 300 feet from the place it left the road. It was found to have a dented top, left front fender, right rear fender and damaged hood, Damage to the truck and its contents exceeded $1,000.

The driver was using his seat belt at the time of the accident. Though somewhat dazed, he suffered only minor bruises and lacerations and had released himself and was on his feet when persons in another vehicle stopped to see if he was all right.

CROOKED SPOTTING CAUSES FALL

When the van trailer was backed against the platform where it was to be unloaded, tne spotting was imperfect. One corner of the van touched the platform, while the other corner was 18 inches out. Though the supervisor was aware of the opening, the spotting was not corrected and the work of unloading the cargo proceeded.

One of the men who was unloading the van attempted to step from it to the platform. He moved sideways with his back to the corner of the van that was separated from the platform and stepped into the open space. He fell backward and landed on his head four feet below. His skull was fractured.

Corrective action included instructions to supervisors on job planning to eliminate hazardous conditions. Supervisors and drivers would make certain that truck beds would be flush with platforms when vehicles were spotted for loading and unloading. Workers were instructed to make certain they had proper footing and to maintain an uninterrupted view that would permit them to watch where they were walking when they were carrying loads.

THE SIGN MEANT " KEEP OUT "

Progress on the construction of a catwalk was being checked by two men. The walkway was being built with 36" X 50" sections of steel grating that were to be fitted and welded into channel iron track. The metal floor was suspended 94 inches above a concrete floor. The stairway that provided access to the walkways was conspicuously posted "Keep Out".

During their inspection the two men ascended the posted stairway and walked along the catwalk. The man in the lead proceeded 60 feet along the platform and then turned, intending to continue walking to his right. The weight of the man's body on a loose section of the grating caused it to slip out of the iron tracks in which it rested. The inspector and the grating fell to the concrete floor, nearly eight feet below. The man landed on his left shoulder, dislocating and fracturing a shoulder bone.

The dislocated section of grating was replaced, and all sections were permanently welded into place. The necessity for obeying warning signs and placards was reiterated in instructions given the injured man and to his department head and his subordinates.

FALLING LADDER BROKE TOE

The carpenter had reported for duty and had worked all day without safety snoes. As his shift neared its end he returned to the truck used to transport supplies and workmen within the installation. The venicle was equipped with a retractable step ladder that made possible safe and easy entry of personnel into the truck. The carpenter tried to pull out the ladder. The safety catch failed, and the ladder fell on the man's right foot. A bone in the big toe was fractured.

Corrective action taken to prevent similar accidents included the following:

Retractable ladders were modified to prevent similar falls that might be caused by defective safety catches.

The supervisor instructed all his men to wear safety shoes on the job.

Supervisors were instructed to make special checks to insure employee compliance with standing operating procedure requirements for wearing of protective shoes.

HUNTER STANDS IN MOVING VEHICLE - NOT LONG

The coyote (flourishing because of his ability to survive by making successful adjustments to changes in his environment) was a pest at the western installation. the men who wished to kill the animal made use of their supperior mobility by chasing him in a non-Army pickup truck. One hunter drove the vehicle while the second, a young lieutenant, planned to shoot from a standing position in the truck bed.

A coyote was sighted and the driver gave chase. The quarry moved across country, over rough weed and grass covered terrain, with the hunters in hot pursuit. The truck had reached a speed of 40 miles per hour when the driver saw a dry abandoned irrigation ditch close ahead. He braked and turned but still hit the ditch so hard that the right front tire was blown out.

The officer standing in the truck bed was thrown into the air. Coming down, he struck a six-inch upright piece of angle iron in the truck bed and came to rest with his

body jackknifed over the right side of the truck. Fearing further injury from the angle iron, he threw himself out of the vehicle. A security guard administered first aid for lacerations and bruises to his right thigh and knee, and he was evacuated to an Army hospital.

Corrective actions taken to prevent similar accidents included the following:

Military personnel were given instructions on safety in hunting and other sports.

Standing in the bed of a vehicle while it was in motion was prohibited.

Further coyote hunting would be by means other than a vehicle, under current regulations of the installation Rod and Gun Club.

SCAFFOLD FATALITIES

Recently, two AMC contractor employees were killed when they fell from a scaffold. Fatalities such as these can be prevented by using life lines, or safety belts with the safety lines tied off. The following was extracted from the Chief of Engineer's Safety Program Multiple letter, and describes how a life was saved by proper use of a safety belt:

"A mechanic was working in the elevator shaft of a missile service gantry 100 feet above the landing when some hot slag from a welder's torch began falling on him. He attempted to jump from the scaffold boards on which he was standing to the deck but missed the deck and fell. He was wearing his safety belt with the safety line tied off which kept him suspended in midair until coworkers could pull him to safety."

POWER MOWER HAZARDS

As far as power mowers are concerned, the hazard season is twelve months long. The number of accidents reported reaches a peak in the warm weather months, but injuries also occur during the autumn and winter.

Only a part of the damage mowers do to Army Materiel Command personnel is reflected in AMC accident statistics. The injuries to civilian and other personnel and members of their families hurt during off-duty hours are not recorded. The recordable injuries that are reported suggest that the total cost must be great in terms of time lost from work, parts of the body mutilated, pain and medical expenses.

Here are some reminders on power mower hazards, which seem to be concentrated in a few well-defined areas.

Hazards to Hands

The mower blade provides the main hazard. To do its work, it revolves at a high rate of speed. When a finger gets into its path, amputation is automatic and instantaneous. Saving those fingers is simple, if you will rigidly follow some rather obvious safety precautions.

Hazards to Feet

Foot damage can be severe since parts of the foot other than the toes are likely to come into contact with the whirling blade. Unless safety shoes are worn, injury is pretty certain whenever the foot enters the blade's path.

Falls lead to many of the serious mower injuries to feet. The foot may either slip, or the mower on a grade may move into a position where the blade may strike the foot.

Another frequent source of foot injury is the foreign object - stone, metal or bone - picked up and hurled by the whirling blade.

Hazards to Others

Those foreign objects hurled by the mower blade may strike individuals other than the mower operator. Playing children, bystanders and neighbors occasionally receive severe wounds and eye injuries when struck by mower propelled projectiles.

Here are 20 suggestions that will make your mowing operation safer any time of the year:

1. Make certain your lawn is clear of loose stones, bones, metal, glass and wood before you start your mower. If you fail to pick them up, you may expect your mower to hurl these about the area.

2. Insist that spectators move out of the area being mowed. They are in danger of being struck by any foreign object you may have failed to pick up.

3. Roll or level the lawn to reduce the likelihood of damage to mower blade, machine and operator that can result from the blade striking the ground.

4. Mow the grass only when it is dry. Wet grass adds to the danger of slipping and foot contact with the blade. It may mat inside the guard, adding to the temptation to get fingers near the moving blade. Moisture adds to the danger of electrocution or shock if you are using an electric mower.

5. Wear sensible clothing. Safety shoes are excellent attire. Shoes with soles that reduce the danger of slipping on grassy surfaces are desirable.

6. Make certain that you are thoroughly familiar with the operation of your mower. You need to know how to start and stop it and how to operate its controls. Follow the manufacturer's directions.

7. Make certain the mower is in a sound mechanical condition, with guards in place and controls that operate.

8. Make sure the blades are sharp, balanced, unbent and protected by guards that extend below them.

9. If you are using an electric mower, make sure that the frame is grounded through the cord. A three-wire flexible cord, in good condition, with three-pronged plugs and receptacles should be used.

10. Be careful not to cut the cord when you are operating an electric mower, Cutting the cord may expose you to a dangerous electrical shock.

11. Fuel the mower from Underwriters' Laboratory-approved containers. Fuel that is carelessly dispensed from inadequate containers or improperly stored is a source of fire hazards.

12. Fuel the motor only when it is cool and is not running. Gasoline vapor plus a hot motor can equal fire.

13. Stand on a firm footing when you undertake to start the motor. Keep your hands and feet away from the blade and all other moving parts at all times.

14. Operate the mower at its slowest effective operating speed. This is the safest speed. It is also less irritating to the neighbors than a racing motor.

15. Keep the mower under control. If it pulls you along, a dangerous machine has become your master while it remains in operation.

16. Mow sloping surfaces from side to side. When you push the mower up the grade, it may roll back upon you if you slip. If you push it down the grade, your foot or hand may get underneath the blade if you slip.

17. When the time comes to move from one area to another stop the motor. That moving blade is always ready to pick up loose objects while you are en route to the new site.

18. If you must leave the mower for any reason, stop the motor.

19. A riding mower possesses the additional hazards inherent in small tractors. It may overturn, crush and cut you if you try to operate it on a steep slope.

20. Handle with care at any time or place when you are repairing or adjusting the mower and the blade. When the parts move they are hazardous.

Most power mower accidents can be prevented if the operator will think before he acts and then act deliberately and safely.

EXPLOSIVES SAFETY

TESTING OF HOPPERS USED IN LOADING SEPARATION CHARGE ASSEMBLY FOR THE XM536 FUZE

Tests have been conducted at Lone Star Army Ammunition Plant to determine the effect of an explosion in one of the hoppers of a press that was planned for use in the loading of the Separation Charge Assembly for the XM536 fuze. One possible effect of particular concern was propagation of explosion from hopper-to-hopper.

Photo 1 shows the test setup used to simulate the press under consideration. The steel table on which the hoppers rest is 30 inches square. The hoppers (separated from each other by 26 inches), in a triangular arrangement atop the table, are of the same type that were to be used in loading the Separation charge. The press head was simulated by a 1/8 inch thick metal barrel placed on the center of the table. Each of the hoppers was loaded with 12 1/2 ounces of M9 propellant, type I. An MIAI electric squib was taped to the inside bottom of one hopper and its lead wires attached to a firing line that led to the protected firing position. The squib was fired and the results noted.

Photos 2 and 3 show results of the firing. The exploding propellant tore apart its hopper and blew loose the metal barrel. Fragments from the hopper had sufficient velocity to become imbedded in steel blocks 8 1/2 feet away (photo 4) and in a steel barricade 22 feet away (photos 5 and 6). The explosion did not propagate to propellant in the 2 "target" hoppers. However, one of the hoppers was displaced 15 feet.

As a result of the test it was concluded that the press would have to be placed in a separate cubicle and operated by remote control in order to be safe. The hopper design tested was not considred satisfactory for M9 propellant. Other factors considered included: (1) if the machine were used, quality control samples would have to be pulled remotely, and the press shut down so that inspectors could enter the cubicle to get samples for checking; (2) Maintenance would be difficult since millwrights could not enter the cubicle while the press was in operation and (3) Required production was inadequate to justify expenditures required to make the press safe for use.

ORIGINAL SET-UP WITH 12 1/2 oz. TYPE I M9 PROPELLANT IN EACH HOPPER.

OVERALL VIEW OF AREA IMMEDIATELY AFTER TEST

HOPPERS AND BARREL USED TO SIMULATE HEAD OF LOADING MACHINE (SHOWN IN CENTER OF TABLE, PHOTO #1) AFTER TEST.

VIEW OF TABLE AFTER TEST SHOT

BRASS SHRAPNEL (FROM HOPPER) IMBEDDED IN STEEL BLOCKS 8 1/2 FEET AWAY.

CLOSE UP OF SHRAPNEL IN STEEL BLOCKS.

WHAT COLOR IS SOLID PROPELLANT ?

Tommy Gooch, Safety Office
Redstone Division - Thiokol Chemical Corporation

What color would you say solid propellant is? Brown, white, yellow, grey, black or red?

The truth of the matter is, solid propellants may be in any color or shade of colors. The color depends upon the color of the ingredients and color changes which may come about during changes which occur in the mixture during processing. Into propellant mixes may go oxidizers, fuels, binders, curing agents, catalysts and other materials. Each of these may have the characteristics of predominant color pigments, and this predominant feature may influence the color of the propellant.

Do not depend upon the color to determine whether or not it is a propellant mixture.

By the same logic, do not rely on the texture of a compound in determining whether or not it is a propellant mixture.

This may seem elementary to you, but there have been indications that we can become too familiar with certain characteristics of a mixture and not recognize the same hazard because of slight changes in it.

All compounds should be treated as hazardous material if the contents of the compound are not known by the handler.

Items which are marked as inert should be handled as if they were the real stuff. Inert items may be displayed or used for training purposes somewhat differently than the real stuff; however, the handler should always treat inert items the same as loaded items to prevent becoming lax in hazardous handling techniques.

When you are in a propellant operation, you should consider every spill, splash or contaminant you see as HAZARDOUS MATERIAL. Spills and splashes should be properly cleaned up without delay. Contaminated parts should be treated as such and routed by process procedures to be cleaned of contamination.

DESTRUCTIVE FORCE OF PRIMER DEMONSTRATED

Arthur M. Crook
Safety Assistant, Joliet Arsenal

Joliet Arsenal was recently assigned the task of demilitarizing a number of cartridges (HE M334 T50E2) for the 75mm gun.

This operation involves separating the cartridge cases (Photo A) from the projectile and reducing each to its several component parts.

The propellant, 3.6 pounds per shell, is dumped from the cartridge case into a propellant can located within a shielded enclosure and the primer (400 gram percussion M58), (Photo A) is then removed and placed in a cardboard carton.

Safety, of course, has been engineered into this demilitarization operation and special emphasis has been placed on protecting this primer; however, there is no feasible means of reducing the number of times that this primer is handled. This naturally means that safety is placed squarely on the shoulders of the operating personnel and education becomes paramount.

It was felt that a demonstration of the destructive force of the primer would re-emphasize the hazards and alert operating personnel to the need for extreme caution while handling the primed cartridge case. The initial demonstration was conducted at the burning ground, to determine if it could be safely carried-out near the operating line.

The demonstration consisted of placing the open end of a primed cartridge case (without propellant) at an open end of a 75mm cartridge packing box (Photo B). The primer was fired by striking it with a 20-foot long aluminum rod. Photo C shows the resulting destruction of the packing box.

After operating personnel had witnessed the demonstration, a marked change was noted in their attitudes toward safe handling requirements for items being processed.

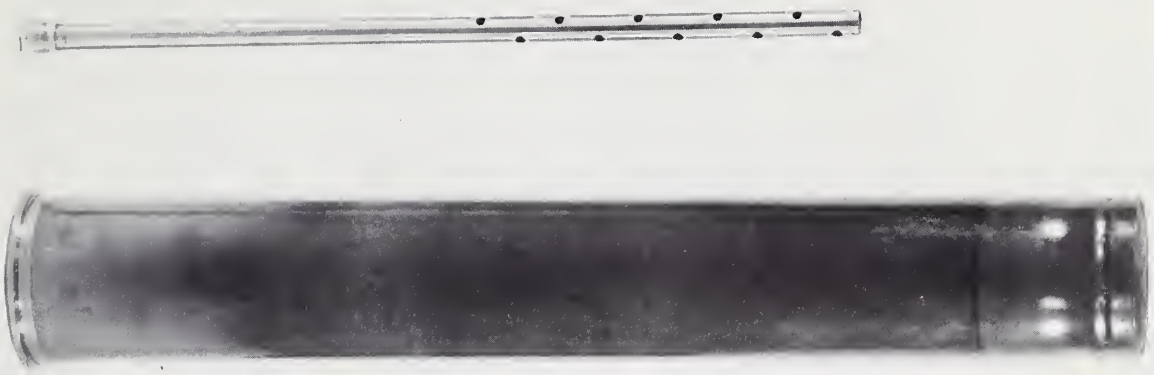


Photo A - Cartridge Case for Projectile HE M334 (T50E2) for the 75mm gun and primer percussion M58.

Photo B - Firing device used for demonstration of destructive power of the M58 percussion primer.

Photo C - The picture was taken at the moment the primer exploded.

ARE YOU SAFE AT THE OFFICE ?

James J. Mayr, Safety Officer
U. S. Army Tank-Automotive Center

Do you work in a safe office? Do you believe that very few people working in administrative areas are hurt on the job? Are there any unsafe conditions in your office? Do you bother to caution fellow employees when you see unsafe acts committed? Are you positive they know the right way to do the job? Who showed them how? Who taught them why?

These are a lot of questions. However, more than sixteen out of every one hundred Federal employees who sustain disabling injuries are employeed in "safe" administrative areas. Department of the Army and Bureau of Employees' Compensation records show that hundreds of office employees are injured on the job.

The same things that cause accidents in our garage and maintenance shops cause them in offices. The tools and equipment -- causative agents -- are different, but the other ingredients are the same -- people, unsafe acts and unsafe conditions. In shop areas, mechanics get hurt from improper use of lathes, grinders and other shop machines; in offices, clerks, stenos, and typists receive injuries from improper operation of typewriters, calculators and other office machines. A carpenter may hurt his finger when his hammer misses the nail, or a plumber pierce his palm by using a screwdriver the wrong way. The office employee staples his finger instead of the paper, or breaks off a pencil point in his palm. A fall doesn't hurt any less if it's due to grease on the shop aisle, or a carelessly discarded piece of carbon paper in the office aisle.

Everyone can see the need for shop safety because of the many hazards associated with industrial operations. The same viewpoint should prevail about office safety. The help of all is needed to keep safety from being considered as something useful only in industrial areas, or as something separate from the office job and everyday activities. Safe practices should be made a part of mental makeup of every worker, regardless of the nature of his job.

Past experience will help in identifying the hazards associated with filing cabinets, desk drawers, housekeeping, falls and stairways. Do something about them. Correct unsafe conditions or report them for correction.

A well-grooved safety habit on the job is one of your best defenses in this life. Once it becomes a full-time companion, it will go a long way in reducing occasional lapses into thoughtless and careless actions which produce the accidents that cost much in pain and suffering, money and time.

THE MEANING OF SAFETY STATISTICS

H. P. Thune
Safety Director, Aberdeen Proving Ground

Aberdeen Proving Ground recently passed 8,000,000 civilian manhours without a disabling injury of an Army employee. This achievement was shared by the installation and the activities located there, including the U. S. Army Test and Evaluation Command, the Ballistics Research Laboratories, the Human Engineering Laboratory, the Coating and Chemical Laboratory, the Army Materiel Command Board, the Joint Military Packaging Training Center, the 25th Military Police Detachment (CI) and the Limited War Laboratory. The APG Safety Director discussed the record in terms of injuries prevented in the following message furnished APG supervisors.

These are proud but empty statistics unless converted into "what might have been". The disabling injury accident frequency for all American industry is six accidents per million manhours worked. So - let's see what might have been if we at Aberdeen Proving Ground had had the experience of an average industry.

Forty-eight disabling injuries would have occurred during 8,000,000 manhours of work. Two of these injuries would have resulted in permanent impairment to a worker. Thirteen injuries would have involved the trunk of an employee's body - injuries such as hernias, back injuries, and broken ribs. Eleven injuries from handling materials or tools would have involved hands or wrists seriously enough to be disabling. Feet and toes would account for about five injuries - perhaps crushing injuries that are slow to heal. Arms and legs would have been involved in about ten injuries - perhaps compound fractures from falls that put good men in bed for a while. Three injuries probaby would involve the head - serious injuries such as fractured skulls from falling objects or perhaps chemical or powder burns to the face. The doctors would have had one or two serious eye cases with a painful stay in the hospital. To top off our tale of pain and sorrow we would perhaps have had five cases of multiple injuries involving machinery which were serious enough to keep a man off the job.

That is not a pretty picture but it is realistic. It could have happened here. One man in one hundred at Aberdeen Proving Ground could have been seriously injured since 1 June 1963 if we had had an average safety program.

Forty-eight disabling injuries which we did NOT have would have cost $35,040.00 which we did NOT spend, and NOBODY spent 1,296 days in bed or on sick leave as a result of a disabling injury.

The point of my message is - WE - all of us working together have created an outstanding safety performance and thereby have avoided a lot of pain, sorrow and expense. SAFETY PAYS - IT PAYS EVERYBODY - EVERYDAY!!

REFERENCE PUBLICATIONS

AMCR 70-11, 12 May 1964
Research and Development, Military Potential Tests (Paragraph 5d)

AMCR 190-3, 24 March 1964
Physical Security and Protective Services Program

AMCR 735-1, 4 May 1964
Maintenance and Readiness Classification of Materiel (Paragraphs 4i and j)

AR 15-22, 18 May 1964
Boards, Commissions, and Committees, Nuclear Weapon Accident Investigation Board (CONUS)

AR 385-65, 25 March 1964
Identification of Inert Ammunition and Ammunition Components

AR 420-94, 7 May 1964
Fire Protection for Electronic Digital Computers and Recorded Data

AR 580-14, 13 March 1964
Security Requirements for Nuclear Weapons

DA Cir 385-2, 16 March 1964
Safe Operation of Truck, Utility, 1/4 Ton, 4 x 4, M151

DA Cir 385-4, 17 April 1964
Local Handling, Storage, and Disposal of Unwanted Radioactive Material

DA TA 50-914, 16 March 1964
Individual Safety and Protective Clothing and Equipment

DO YOU KNOW?

Here are ten questions that will test your knowledge of AMCR 385-224. They deal with a few of the many subjects regularly encountered by safety personnel at Army Materiel Command installations and activities. To make certain you make an accurate check of your ready knowledge, it is suggested that you write your answers below before you turn to the correct answers on pages 38 and 39.

1. What advisory provisions of AMCR 385-224 may be waived only upon obtaining prior approval of Headquarters, Army Materiel Command?

   Answer:

   Reference:

2. What explosive is approximately as sensitive to impact as mercury fulminate and has about the same order of friction sensitivity as lead azide?

   Answer:

   Reference:

3. How long may locomotives be left in front of buildings and loading docks that contain hazardous materials?

   Answer:

   Reference:

4. When an aircraft containing explosives and ammunition is parked, how many "explosives" placards shall be displayed and where shall they be placed?

   Answer:

   Reference:

5. What is the minimum distance that must separate parallel beds of explosives that are prepared for burning?

   Answer:

   Reference:

6. When storage tanks are entered, what minimum number of people is required to be present at the operation?

   Answer:

   Reference:

7. If electrical work must be performed on energized circuits, what is the minimum number of persons required at the operations?

   Answer:

   Reference:

8. How often should protective clothing and equipment be inspected by the foreman to be certain it is in serviceable condition?

   Answer:

   Reference:

9. What safety regulations govern shipments of ammunition and explosives on public highways?

   Answer:

   Reference:

10. How shall large quantities of bulk initiating explosives be destroyed?

    Answer:

    Reference:

NATIONAL SAFETY COUNCIL AWARDS

The National Safety Council has released safety awards for the following AMC installations. All personnel involved are congratulated for their efforts to improve AMC safety.

The U. S. Army Natick Laboratories, Natick, Massachusetts recently was awarded the NSC Award of Merit for operating 1,367,741 man-hours without a disabling injury from 31 August 1963 to 15 January 1964.

A NSC Award of Honor will be received by the U. S. Army Electronics Research and Development Laboratories, Fort Monmouth, New Jersey for achieving an outstanding record of 3,004,704 man-hours without a disabling injury. The award period was from 8 October 1963 to 20 March 1964.

Detroit Procurement District personnel were responsible for operating 1,240,519 man-hours without a disabling injury from 1 July 1963 to 31 January 1964. This District has won the NSC Award of Merit for this achievement.

Tooele Army Depot, Tooele, Utah has also been awarded a NSC Award of Merit. This was due to operating 1,352,040 man-hours without a disabling injury from 7 January 1964 to 17 March 1964.

AMC AWARD OF HONOR

PRESENTED WATERVLIET ARSENEL

Major General Nelson M. Lynde, who recently retired as Commanding General, U. S. Army Weapons Command, is shown presenting the Army Materiel Command Award of Honor for Safety for FY 1963 to Colonel Keith T. O'Keefe, Commanding Officer, and Frank J. McGinnis, Safety Director, Watervliet Arsenal. The accident prevention record achieved by the Arsenal in FY 1963 was the best of its 150-year history. Mr. McGinnis, safety director since 1942, has received a Department of the Army commendation and award for his outstanding direction of the installation's over-all safety program.

SAN FRANCISCO PROCUREMENT DISTRICT

RECEIVES TWO SAFETY AWARDS

The San Francisco Procurement District has received double honors for achieving an outstanding safety program during 1963. Col. J. E. Johnston, Commander, is shown holding the Army Materiel Command Award of Honor, while Carl Eckhart, district safety officer, holds the National Safety Council Award of Honor.

AMC SAFETY AWARD PRESENTATION

Colonel John W. Graham, Commanding Officer, New York Procurement District, is shown accepting the Army Materiel Command Award of Merit for Safety for FY 1963 from Major General E. J. Gibson, AMC Director of Procurement and Production.

SIERRA ARMY DEPOT RECEIVES AWARDS

Sierra Army Depot's FY 1963 safety record earned recognition in the form of the Army Materiel Command Award of Merit and the National Safety Council Award of Honor. Colonel Harvey Bower, Commanding Officer, and E. E. Crain, Safety Director, are shown holding the awards that were presented by Colonel James M. Moynahan, Sharpe Army Depot commander who represented the Commanding General, U. S. Army Supply and Maintenance Command.

WELL DID YOU KNOW ?

Safety personnel should know most of the answers to the questions on pages 32 and 33. If the answers to some of the questions do surprise you, the references pinpoint parts of AMCR 385-224 you should review.

1. Advisory provisions pertaining to new construction may be waived only upon prior approval of Headquarters, Army Materiel Command.

   Reference: Paragraph 501a, AMCR 385-224.

2. Lead styphnate.

   Reference: Paragraph 1404, AMCR 385-224.

3. Locomotives should remain in these locations only long enough to spot cars for loading and unloading.

   Reference: Paragraph 2106 1, AMCR 385-224.

4. Four. One shall be placed on the nose, one on the tail and one on each side of the plane.

   Reference: Paragraph 2304c, AMCR 385-224.

5. 150 feet.

   Reference: Paragraph 2715d, AMCR 385-224.

6. At least three individuals will be present.

   Reference: Paragraph 929c, AMCR 385-224.

7. At least two persons must be present at all times.

   Reference: Paragraph 607b(2)(a), AMCR 385-224.

8. These should be inspected at least weekly.

   Reference: Paragraph 1005a, AMCR 385-224.

9. Interstate Commerce Commission Motor Carrier Safety Regulations govern motor vehicle shipments on public highways.

   Reference: Paragraph 2204, AMCR 385-224.

10. By detonation.

    Reference: Paragraph 2715b, AMCR 385-224.

TRUCKERS SPEAK UP

What's the most common fault of drivers? According to a survey of Midwest truck-trailer drivers, it's failure to signal properly when turning or passing. In the poll, 125 drivers from one company were queried. Of these, 64 listed improper signaling as the number one bonehead stunt. Forty-seven thought failure to dim lights when approaching another vehicle was the worst offense. In third place was following too closely.

Construction Section, National Safety Council

HEADQUARTERS
UNITED STATES ARMY MATERIEL COMMAND
WASHINGTON, D. C., 20315

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(AMCAD-S)

S. D. SMITH, JR.
Major General, U. S. Army
Chief of Staff

OFFICIAL:

R. O. DAVIDSON
Colonel, GS
Chief, Administrative Office

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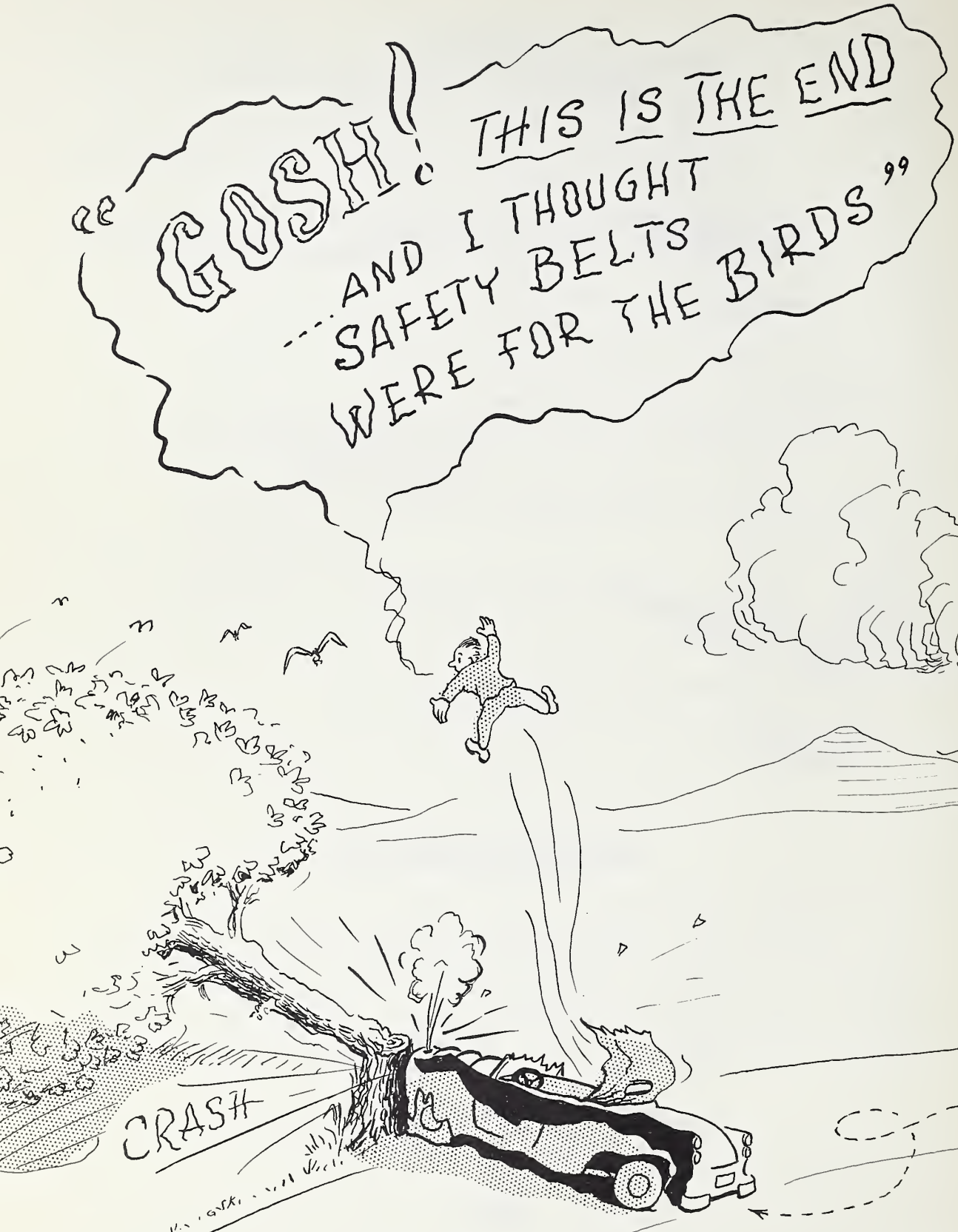
"GOSH! THIS IS THE END
...AND I THOUGHT
SAFETY BELTS
WERE FOR THE BIRDS"
CRASH

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FLARE